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28 April 1972

Mr. Gene James
Office of Deputy Administrator
for Monitoring
Environmental Protection Agency
Washington, D. C. 20460

Dear Mr. James:

Enclosed you will find material resulting from work performed in connection with EPA's Lake Survey Program.

The enclosures include the actual geographic location readouts and plot of the lakes; a short synopsis of how the work was accomplished; and [redacted] approach to conducting EPA's Lake Survey Program.

STAT

We hope that the material provided meets your requirements and we would certainly be pleased to carry out the suggested program in the future. Coordination and approval with other agencies would, of course, be necessary, but it is felt that if this can be accomplished it would be to the overall benefit of the Government.

[redacted]

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Manager, Special Projects
Office

[redacted] STAT

APPROACH TO EPA LAKE SURVEY PROGRAM

1. GENERAL

Based upon [redacted] STAT experience in the extraction of geoscience information from aerial photographic interpretation, it appears that most, if not all, of the information sought by limnologists about lakes and their environs (i.e. - point sources of pollution, such as industrial and municipal outfalls, septic tanks, etc. or areal factors, such as the area in a lakes drainage basin which is devoted to agriculture, occupied by forests, grazing land, etc.) can be determined by the interpretation of high resolution, small scale military photography. Collateral information, such as the areas served by municipal sewerage, can be determined by obtaining appropriate maps from the local sanitary commissions or agencies.

The advantage in the use of military coverage includes the small scales which permit wide area coverage without the sacrifice of the information which EPA desires to obtain. In addition, through [redacted] this imagery can be readily obtained at little cost. It is STAT already formatted and the software for photogrammetric data processing is in existence and, for the purposes of the types of information that EPA is seeking, needs no ground control.

Despite the classified nature of the military photographs, the information derived from them would be unclassified. Therefore, no problems are foreseen in the use of this sort of medium from the security standpoint, particularly since the source of the information to be interpreted need not be revealed.

2. PROPOSED EFFORT

The following summarizes the steps to be taken in the lake survey:

(a) Delineate the drainage basins of each lake on a suitable scale map.

(b) Delineate the extent of military coverage on the same maps.

(c) Identify the extent of gaps in coverage and areas where clouds or image quality makes the coverage unsuitable for interpretation.

(d) Delineate the coverage flown by the USGS in the gaps.

(e) Task a suitable government agency to fly gap-filler coverage (if gaps still exist).

(f) Compile, correlate, measure, and interpret all imagery in conjunction with available collateral data and put reduced information/data in a format(s) meeting EPA requirements (plots/overlays and text).

We foresee one major problem in lake surveys. It appears that many lakes have extremely large drainage base areas. Thus, as indicated, it seems that the optimum photography for delineating the acreages of agricultural and forest lands of various categories within the drainage basins would be small scale, military type, photography. At present, the amount of coverage of this photography is unknown in detail although the areal extent over the past five years is known, in general (typical data has been shown to EPA and can be supplied under separate cover).

Therefore, the first step which we would propose to take would be to delineate on small scale maps the drainage basins of all the lakes selected by EPA within any region. This outlining would constitute the area where aerial photographic coverage is required. A map scale of 1:1,000,000 would permit easy appreciation of the coverage requirements for both large and small drainage basins. Subsequently to identifying the extent of the drainage basins, we would plot the amount of military-type coverage which has been flown within the last five years. Again, this would be done at a scale of 1:1,000,000.

In addition, each plot would be keyed to a description of the quality of the coverage and the extent of cloud coverage. This second step would then permit us to know how much coverage is available, of what

quality, and where gaps are present. We would then proceed to delineate USGS coverage, which is flown under cloud-free conditions on a block-coverage basis.

The completion of these tasks would then allow us to pinpoint what additional coverage is required, so our next step would be to task RADC or other sources to fly gap-filling photography on a priority basis. Lakes which are considered most immediately important in any one region by EPA would constitute the highest priority targets. Nearby lower priority lakes would be covered if they are located nearby or enroute to higher priority areas. Otherwise they would be left until later. We would also suggest that a requirement be levied on the military to fly additional coverage of the small scale photography which we believe constitutes ideal medium for interpreting both point and regional features needed for limnological assessment.

All input imagery and data would be correlated and compiled on a convenient scale base, probably a map or map pull-up (1/250,000, 1/50,000, other), using interpretation instruments and transfer devices (such as the B&L Zoom Transfer Scope). Measurements (drainage, geographic areas, etc.) would either be performed on the imagery (where computerized analytical photogrammetric programs exist) or on the map bases. Final outputs to EPA would be unclassified maps, overlays, text, and alpha-numeric data.

Lake Location for EPA 1972 Lake Eutrophication Survey

A work effort was performed to locate, plot, and determine coordinates of specific lakes included in the EPA 1972 Lake Eutrophication Survey. Lake references provided to [redacted] were lake name, state, county, and local civil facility, the latter normally being a city or town. STAT

Initially, it was hoped that lake locations could be retrieved directly from a gazeteer or other reference source. However, readily available references were inadequate, particularly in light of the minor lakes to be located. The Library of Congress, Map Information Office, [redacted] would be a good initial contact for further efforts; as would state water resource agencies. STAT

The lake search was performed using a variety of readily available map products. Location utilized small scale USGS state maps (1:1,000,000) which name most lakes and provide ready county reference. Road maps were useful in providing city or town reference and larger scale coverage of urban areas. USGS 1:250,000 maps were obtained for some areas but were found not to provide much additional aid. Some 1:24,000 maps on hand were searched. (It being surprising to find that some minor lakes were not named even on that base.) Approximately 80% of lakes were located by name, the remainder being rather minor lakes. Those lakes not located by name can be secured by searching larger scale maps (USGS 1:250,000 and 1:24,000) or by contacting state and county organizations. (A few lakes were not located due to insufficient reference; county only or data errors in the computer printout.)

Lakes were plotted on ACIC 1:1,000,000 ONC series charts. This base was selected because of its large format and ease of geographic scaling. Figures 1 and 2 show the areal coverage of the maps. The ONC plots show lakes by colored dots (red - lakes located by name, yellow - lakes not located by name, nearest facility reference plotted) coded with state name and lake number as given in the computer printout.

As lakes were plotted, geographic coordinated were read out to the nearest minute of latitude and longitude. That data is presented in a separate attachment. The geographic coordinates permit access to larger scale map series, in particular USGS 1:250,000, 1:62,500 and 1:24,000 series topographic maps. The 1:250,000 USGS map index is provided in attachment, as are state quadrangle indexes.

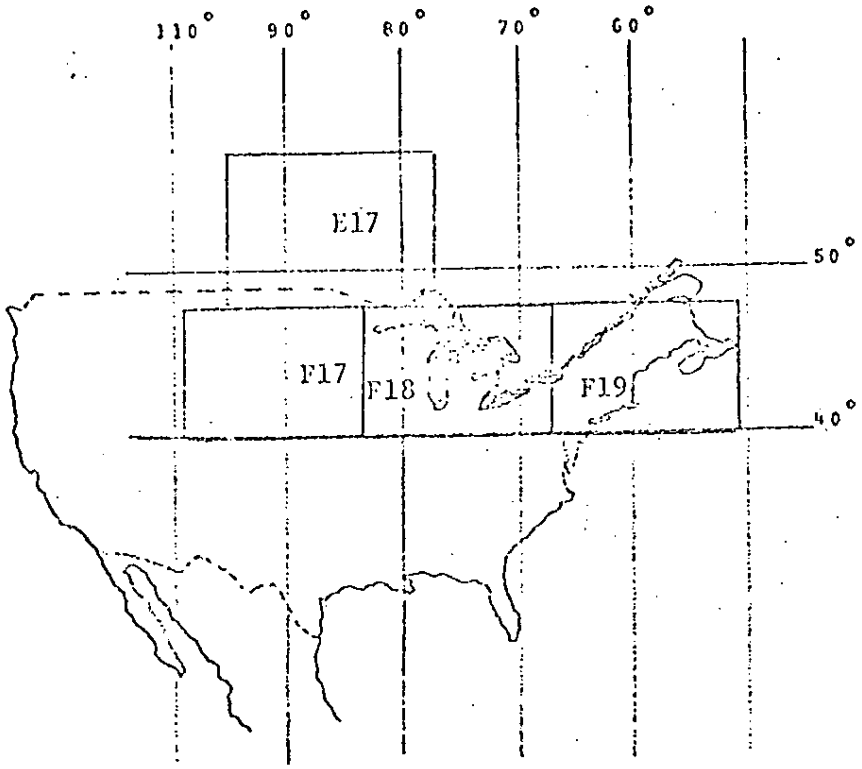

FIGURE 1. ONC 1:1,000,000 COVERAGE - US

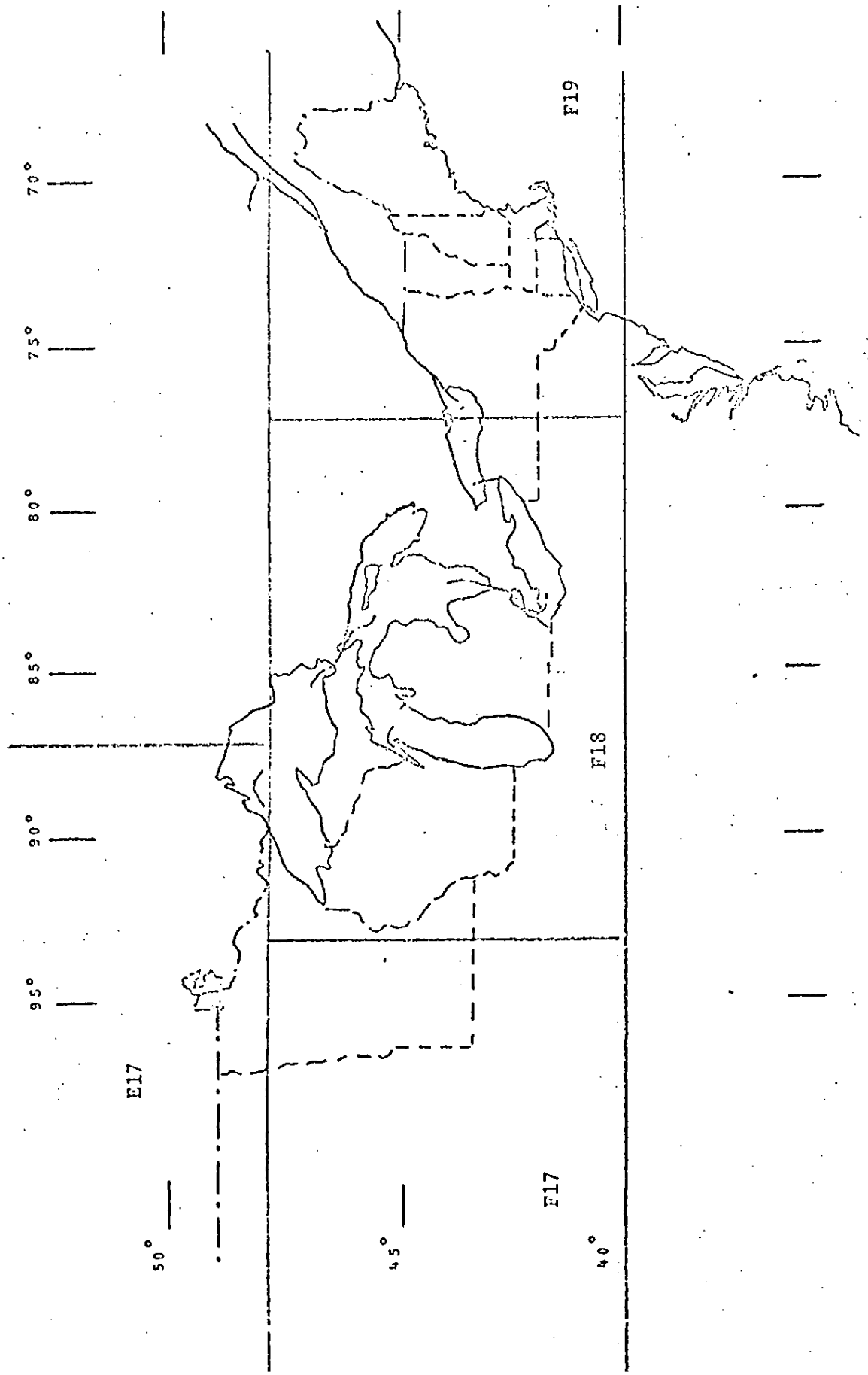

FIGURE 2. ONC 1:1,000,000 COVERAGE - STATE

Lake Coordinates for EPA 1972 Lake Eutrophication Survey

The following is a listing by geographic coordinates of lakes included in the 1972 Lake Eutrophication Survey. An asterick following lake name indicates that the lake was not located by name; coordinates given are those of the nearest facility provided in the computer printout. Remarks are given in parenthesis to left of coordinates; name is that shown on source map.

CONNECTICUT

4	Aspinook Pond	41° 37', -71° 59'	
5	Bantam Lake	41° 42', -73° 13'	
6	Community Lake	41° 29', -72° 49'	
7	Eagleville Lake	41° 47', -72° 17'	
8	Hanover Pond *	41° 32', -72° 49'	
919	Hyde Pond	41° 26', -72° 01'	
19	Laurel Lake *	41° 47', -72° 32'	
10	Union Pond	41° 52', -72° 29'	
11	Wononpakook Lake	41° 57', -73° 27'	
12	Zoar Lake	41° 24', -73° 11'	

MAINE

13	Crystal Lake	44° 08', -70° 40'	(Pond)
14	Dolby Lake	45° 39', -68° 37'	
15	Douglas Pond	44° 49', -69° 23'	
16	Estes Lake *	43° 26', -70° 46'	
17	Gulf Island Pond *	44° 30', -70° 13'	
18	Long Lake	44° 02', -70° 39'	
19	Long Pond	45° 58', -70° 09'	
20	Mattawamkeag Lake	45° 59', -68° 10'	
21	Moosehead Lake	45° 40', -69° 40'	
22	Rangeley Lake	44° 57', -70° 42'	
922	Sebago Lake	43° 53', -70° 34'	
23	Sebasticook Lake	44° 51', -69° 15'	

MASSACHUSETTS

923	Assabet River Impoundment *	42° 23', -71° 34'	
25	Hagger Pond	42° 21', -71° 29'	
26	Harris Pond *	42° 08', -71° 32'	
27	Maynard Impoundment *	42° 27', -71° 27'	
28	Norton Reservoir	41° 59', -71° 12'	
29	Turner Reservoir	41° 50', -71° 21'	(James V. Turner Reservoir)

MICHIGAN

197	Ackley Lake *	42° 10', -85° 51'	
198	Ada Lake	42° 56', -85° 29'	
199	Allegan Lake	42° 33', -85° 55'	
200	Autrain River Basin Reservoir	46° 24', -86° 50'	
201	Barron Lake	43° 23', -85° 28'	
202	Barton Lake	42° 05', -85° 35'	
203	Beaverton Dam *	43° 49', -84° 56'	
204	Bellaire Lake	44° 57', -85° 13'	
205	Bellville Lake	42° 12', -83° 29'	
206	Bestie Lake	44° 35', -86° 04'	
207	Betty Lake	44° 38', -86° 13'	
208	Bob Bessie Lake	41° 54', -84° 36'	
209	Brighten Lake	42° 31', -83° 49'	(Brighton)
210	Brule Is. Dam	45° 57', -88° 13'	
211	Buck Lake	46° 02', -88° 24'	
212	Chapin Lake	41° 56', -86° 21'	
213	Charlevoix Lake	45° 17', -85° 10'	
214	Chemung Lake *	42° 35', -83° 51'	
215	Cledonia Reservoir *	42° 50', -85° 15'	
216	Clinton Lake *	42° 41', -83° 29'	(Insf. Ref. County Coord.)
217	Constatine Lake	41° 54', -85° 38'	
218	Crooked Lake	45° 25', -84° 50'	
219	Cryderman Lake *	42° 46', -84° 54'	
220	Deer Lake	46° 31', -87° 51'	
221	Elk Lake	44° 51', -85° 22'	
223	Fallasberg Reservoir *	43° 06', -85° 13'	
224	Fenton Lake	42° 50', -83° 43'	
225	Ford Lake	42° 13', -83° 35'	
226	Foster Reservoir	42° 19', -83° 46'	
227	Fremont Lake	43° 27', -85° 58'	
228	Gang Lake *	42° 23', -84° 42'	
229	Gogebic Lake	46° 30', -89° 34'	
230	Grass Lakes*	43° 09', -85° 30'	(Insf. Ref.)

231	Macatawa Lake	42° 47', -86° 10' (See Macatawa, 244)
232	Huden Pyle Dam Pond *	44° 24', -85° 24'
233	Hunters Lake	44° 33', -83° 43'
235	Jonesville Mill Pond *	41° 58', -84° 32'
236	Jordan Lake	42° 46', -85° 08'
237	Kalamazoo Lake	42° 39', -86° 11'
238	Kearsley Reservoir	43° 03', -83° 38'
239	Kent Lake	42° 32', -83° 39'
240	Kimberly Clark Dam *	45° 49', -88° 04'
241	Lime Kiln Lake	42° 27', -83° 42.5'
242	Lobdell Lake	42° 47', -83° 49'
243	Lone Lake *	41° 52', -85° 12'
244	Macatawa Lake	42° 47', -86° 10'
245	Manistee Lake	44° 15', -86° 18'
246	Marble Lake	41° 55', -84° 54'
247	Marquette Lake	43° 56', -86° 26'
248	Meadowbrook Lake	42° 26', -83° 27' (Meadowbrook C.C.)
250	Missaukee Lake	44° 19', -85° 14'
251	Moon Lake *	42° 40', -84° 04'
252	Mormon Pond *	42° 18', -85° 25'
253	Morrow Lake NOTE: Can Mormon Pond and Morrow Lake = Morrow Pond?	42° 17', -85° 28' (Morrow Pond)
254	Mullet Lake	45° 32', -84° 30'
255	Muskegon Lake	43° 14', -86° 18'
256	Nicolet	46° 25', -84° 14'
257	Otsego Lake *	42° 28', -85° 42'
258	Otter Lake *	42° 44', -83° 26' (Insf. Ref.)
259	Painter Lake *	41° 55', -85° 38'
260	Park Lake	42° 47', -84° 26'
261	Pentwater Lake	43° 47', -86° 25'
262	Plainwell Dam *	42° 20', -85° 35'
263	Platte Lake	44° 41', -86° 05'
264	Ponemnah Lake	42° 50', -83° 45'
265	Portage Lake 1 Houghton Cnt 2 Manistee Cnt	 47° 04', -88° 30' 44° 22', -86° 14'

MICHIGAN (CONT'D)

266	Potters Lake *	43° 03', -83° 19'	
267	Randall Lake	41° 58', -85° 02'	
268	Rogers Lake	43° 37', -85° 29'	
269	Rose Lake	43° 53', -84° 31'	(Ross?)
270	Sanford Lake	43° 44', -84° 24'	
271	Saxton Fall Dam	46° 27', -90° 10'	
272	Silver Lake	42° 38', -86° 09'	
273	Spring Lake	43° 48', -85° 01'	(Insf. Ref. County Coord.)
274	St. Clair Lake	42° 22', -82° 40'	
276	Sturgeon Lake		
	1 Norway	45° 47', -88° 04'	
	2 Colon	41° 58', -85° 20'	
278	Tamarack Lake	43° 27', -85° 16'	
279	Tecumseh Reservoir *	42° 09', -84° 02'	
280	Thorrapple Lake	42° 38', -85° 11'	
281	Torch Lake	47° 10', -88° 25'	
282	Union Lake	42° 03', -85° 11'	
283	Victoria Dam *	46° 41', -89° 15'	(Insf. Ref.)
284	Weber Dam	42° 57', -84° 54'	(Webber)
285	White Lake	43° 23', -86° 23'	
287	Wiggins Lake *	47° 14', -88° 10'	
288	Wyandotte Lake *	42° 12', -83° 07'	

MINNESOTA

289	Addie Lake	44° 48', -94° 33'	(Allie)
290	Albert Lea Lake	43° 38', -93° 18'	
291	Auburn Lake	44° 52', -93° 41'	
292	Badger Lake	47° 41', -96° 01'	
293	Bartlett Lake	47° 53', -94° 16'	
294	Bear Lake	43° 33', -93° 30'	
295	Big Birch Lake	45° 46', -94° 45'	
296	Big Lake	45° 25', -94° 34'	
297	Big Stone Lake	45° 25', -96° 38'	
298	Birch Lake	47° 03', -93° 52'	

299	Blackduck Lake	47° 44', -94° 38'	
300	Blackhoof Lake *	46° 28', -94° 00'	
301	Buffalo Lake	45° 10', -93° 53'	
302	Carrigan Lake *	45° 04', -93° 58'	
303	Cass Lake	47° 25', -94° 33'	
304	Clearwater Lake	45° 18', -94° 07'	
305	Clitherall Lake	46° 15', -95° 40'	
306	Cloverleaf Lake *	46° 36', -94° 19'	
307	Cokato Lake	45° 07', -94° 10'	
308	Cranberry Lake *	46° 29', -93° 53'	
309	Darwin Lake *	45° 06', -94° 24'	
310	Deer Lake *	46° 58', -94° 51'	
311	East Battle Lake	46° 18', -95° 33'	
312	Eily Lake	46° 44', -93° 57'	(Emily)
313	Elbow Lake	48° 01', -92° 39'	
314	Eleventh Lake	47° 01', -94° 43'	
315	Elk Lake	45° 28', -93° 56'	
316	Embarrass Lake *	47° 32', -92° 20'	
317	Epein Lake *	44° 26', -93° 35'	
318	Fall Lake	47° 58', -91° 43'	
319	Fanny Lake *	46° 00', -95° 41'	
320	Fremont Lake	45° 27', -93° 34'	
321	French Lake	45° 10', -93° 20'	
322	Geneva Lake	43° 48', -93° 16'	
323	George Watch Lake	45° 10', -93° 05'	
324	Graham Lake *	44° 30', -93° 38'	
325	Gull Lake	46° 27', -94° 20'	
326	Hendricks Lake	44° 29', -96° 27'	
327	Heron Lake	43° 46', -95° 16'	
328	High Island	44° 40', -94° 13'	
329	Horsehoe Lake *	47° 29', -92° 28'	
330	Howard Lake	45° 15', -93° 02'	
331	Kelly Lake	47° 24', -93° 01'	
332	Lac Qui Parle	45° 07', -96° 00'	
333	Lake of the Woods	49° 00', -95° 00'	

MINNESOTA (CONT'D)

334	Leech Lake	47° 10', -94° 23'	
335	Lily Lake *	44° 06', -94° 13'	
336	Little Grant Lake *	46° 06', -95° 49'	
337	Lower Partridge Lake *	47° 32', -92° 10'	
338	Madison Lake	44° 12', -93° 53'	
339	Mahnomen Lake *	46° 29', -94° 02'	
340	Malmeda Lake *	45° 42', -95° 30'	
341	Maple Lake	45° 47', -95° 22'	
342	Marsh Lake	45° 12', -96° 09'	
343	Marshy Lake *	46° 09', -95° 20'	
344	Mashkenode Lake	47° 00', -92° 00'	(Insf. Ref. County Location)
345	McQuade Lake	47° 31', -92° 45'	
346	Meowissen Lake	44° 46', -93° 47'	
347	Mille Lacs Lake	46° 10', -93° 40'	
349	Minnetonka Lake	44° 44', -93° 39'	
350	Minnewaska Lake		
	1 Hennepin	44° 53', -93° 37'	(Minnewashta)
	2 Pope	45° 37', -95° 27'	
351	Moon Lake	45° 58', -95° 36'	
352	Mud Lake *		
	1 Wright	45° 14', -94° 00'	
	2 Chisago	45° 23', -92° 51'	
	3 Itasca	47° 19', -93° 18'	
	4 Kanabec	45° 54', -93° 10'	
	5 St. Louis	46° 37', -92° 08'	
	6 Hennepin	44° 54', -93° 44'	
353	North Central Lake	45° 25', -92° 50'	(Center)
354	Pelican Lake		
	1 Crow Wing	46° 35', -94° 10'	
	2 St. Louis	48° 04', -92° 54'	
355	Peltier Lake		
	1 Washington	45° 11', -93° 03'	
	2 Anoka	43° 56', -91° 38'	

MINNESOTA (CONT'D)

356	Pike Lake *	45° 45', -95° 37'
357	Pleasant Lake *	45° 28', -94° 20'
358	Portage Lake *	46° 26', -95° 34'
359	Pullman Lake *	45° 49', -96° 09'
360	Rabbit Lake	46° 32', -93° 56'
361	Rice Lake *	46° 30', -95° 38'
362	Rice Marsh	44° 51', -93° 32'
363	Round Lake	47° 37', -94° 10'
364	Rush Lake	46° 41', -94° 07'
365	Saint Louis Bay	46° 42', -92° 11'
366	Sakatah Lake	44° 13', -93° 32'
367	Sarah Lake	45° 04', -93° 41'
368	School Lake	45° 15', -93° 39'
369	Shagawa Lake	47° 55', -91° 53'
370	Sham Lake	44° 36', -95° 40'
371	Silver Lake	44° 54', -94° 12'
372	Six Mile Lake	47° 29', -92° 49'
373	South Lake	44° 59', -94° 02'
374	St. Clair Lake	46° 49', -95° 51'
375	Superior Bay	46° 44', -92° 04'
377	Swain Lake	47° 18', -93° 11'
378	Swims Lake	45° 52', -95° 09'
379	Three Mile Lake	47° 31', -92° 33'
380	Timber Lake	43° 49', -95° 13'
381	Trace Lake	45° 49', -94° 45'
382	Trout Lake	47° 16', -93° 24'
383	Turtle River	47° 35', -94° 48'
384	Tustin Lake	44° 12', -93° 40'
385	Tuttle Lake	43° 30', -94° 35'
386	Upper Hay Lake	46° 39', -94° 20'
387	Waconia Lake	44° 52', -93° 47'
388	Willow Lake	44° 19', -95° 12'
389	Winnbigoshish Lake	47° 25', -94° 10'
390	Winona Lake	45° 53', -95° 22'
391	Wolf Lake	46° 49', -95° 23'

392	Woodcock Lake	45° 14', -94° 56'

NEW HAMPSHIRE

30	Kezar Lake *	43° 24', -71° 59'
31	Winnipesaukee Lake	43° 35', -71° 20'
32	Power Mill Pond *	42° 52', -71° 58'

NEW YORK

62	Ashokan Reservoir	41° 57', -74° 12'
63	Black Lake	44° 29', -75° 37'
64	Canadarago Lake	42° 49', -75° 00'
65	Canandaigua Lake	42° 46', -77° 18'
66	Cannonsville Reservoir	42° 05', -75° 20'
67	Carry Falls Reservoir	44° 25', -74° 44'
68	Cassadaga Lake	42° 21', -79° 19'
69	Cayuga Lake	42° 40', -76° 42'
70	Champlain Lake	44° 30', -73° 20'
71	Chautaugua Lake	42° 07', -79° 20'
72	Cross Lake	43° 07', -76° 29'
74	Goodyear Lake	42° 31', -75° 03'
75	Greenwood Lake	41° 12', -74° 09'
76	Huntington Lake	41° 41', -74° 59'
77	Irondequoit Lake	43° 12', -72° 31'
78	Keuka Lake	42° 30', -77° 09'
79	Lenera Lake *	42° 31', -76° 59'
80	Long Lake	44° 00', -74° 24'
81	Mill Pond	41° 17', -73° 50'
82	Mud Lake	44° 17', -75° 49'
83	Oneida Lake	43° 10', -75° 52'
84	Onondaga Lake	43° 06', -76° 32'
86	Otter Lake	43° 08', -76° 32'
87	Owasco Inlet	42° 40', -76° 26'
88	Owasco Lake	42° 50', -76° 31'
89	Pompton Lake Reservoir	41° 00', -74° 17' (In N.J.)
90	Raquette Pond	44° 14', -74° 33'
91	Round Lake	42° 57', -73° 47'
92	Roundout Reservoir	41° 49', -74° 28'

NEW YORK (CONT'D)		
93	Sacandaga Reservoir	43° 07', -74° 12'
94	Saratoga Lake	43° 01', -73° 45'
95	Schroon Lake	43° 48', -73° 47'
96	Seneca Lake	42° 40', -76° 55'
97	Swan Lake	41° 46', -74° 48'
98	Swinging Bridge Reservoir	41° 37', -74° 47'
99	Union Falls Reservoir	44° 45', -73° 55'
RHODE ISLAND		
34	Georgiaville Pond *	41° 53', -71° 32'
35	Slatersville Reservoir	41° 59', -71° 36'
VERMONT		
36	Lake Champlain	44° 30', -73° 20'
37	Clyde Pond	44° 56', -72° 10'
928	Eligo Pond	44° 36', -72° 12'
38	Hardwick Lake	44° 32', -72° 13'
39	Harriman Reservoir	42° 49', -72° 54'
40	Lamoille Lake	44° 34', -72° 37'
41	Memphremagog Lake	44° 58', -72° 14'
42	Mud Pond	44° 36', -71° 47'
WISCONSIN		
422	Albany Mill Pond	
	1 Belleville *	42° 52', -89° 32'
	2 Montello *	43° 48', -89° 19'
	3 Evansville *	42° 47', -89° 18'
423	Altoona Lake	44° 49', -91° 25'
424	Beaver Dam	43° 30', -88° 52'
425	Belleville Mill Pond *	43° 01', -89° 44'
426	Big Elk *	45° 42', -90° 23'
427	Big Martha Lake *	46° 10', -90° 04'
428	Biron Lake	44° 27', -89° 44'
429	Butte Des Morts Lake	44° 05', -88° 39'

WISCONSIN (CONT'D)

430	Butternut Lake	45° 58', -90° 31'	
432	Castle Rock Flowage Lake	43° 56', -89° 58'	
433	Clintonville Mill Pond *	44° 40', -88° 54'	
435	Decatur Lake	42° 39', -89° 25'	
436	Delavan Lake	42° 37', -88° 37'	
437	Dell Pond *	44° 49', -91° 30'	
438	Eau Claire Lake	44° 46', -91° 07'	
439	Eau Pleine Reservoir	44° 45', -89° 55'	
440	Fox River Lakes *	42° 57', -88° 20'	
441	Green Bay	44° 50', -87° 50'	
442	Green Lake	43° 49', -89° 00'	
443	Kegonda Lake	42° 58', -89° 16'	(Kegonsa)
444	Kelly Lake	45° 01', -88° 14'	
445	Koshkonong Lake	42° 53', -88° 58'	
446	Little Lake *	44° 11', -88° 28'	
447	Lower Dam Reservoir *	45° 57', -90° 37'	
448	Mendota Lake	43° 06', -89° 26'	
451	Mill Pond		
	1 Caroline San. District *	44° 50', -88° 40'	(Insf. Ref., County Ref. Only)
	2 Dousman	42° 59', -88° 37'	
	3 Wautoma *	44° 04', -89° 18'	
453	Mohawksin Lake	45° 29', -89° 39'	
454	Mud Lake *	44° 09', -87° 58'	
455	Nagawicka Lake	43° 05', -88° 24'	
456	Oconomowoc Lake	43° 06', -88° 27'	
457	Partridge Lake	44° 18', -88° 53'	
458	Petenwell Flowage Lake	44° 10', -89° 57'	
459	Pigeon Lake	46° 21', -91° 21'	
460	Pine Lake	43° 07', -88° 23'	
461	Pond Lake *	43° 42', -88° 58'	
462	Poygan Lake	44° 09', -88° 50'	
463	Shawand Lake	44° 48', -88° 32'	
464	Silver Lake	42° 33', -88° 09'	

WISCONSIN (CONT'D)

465	Sinissippi Lake	43° 22', -88° 37'
466	Small Lake	
	1 Eagle River City *	45° 45', -89° 15'
	2 Pewaukee *	43° 05', -88° 16'
	3 Lake Geneva *	42° 36', -88° 27'
	4 Waukeska *	43° 01', -88° 14'
467	Stevens Point Reservoir *	44° 53', -89° 38'
469	Swan Lake	43° 33', -89° 23'
470	Tainter Lake	44° 59', -91° 51'
471	Tomahawk Lake	45° 50', -89° 40'
472	Town Line Lake *	45° 48', -89° 10'
473	Unnamed Lake	45° 56', -89° 39'
474	Wapogasset Lake	45° 20', -92° 26'
475	Wausaw Lake	44° 55', -89° 38'
476	Whiting Dam	44° 30', -89° 33'
477	Wind Lake	42° 49', -88° 08'
478	Winnebago Lake	44° 00', -88° 25'
479	Wisconsin Lake	43° 23', -89° 35'
480	Wissota Lake	44° 57', -91° 19'

LAKE DOSSIER - BASIC FILE

A. EXTERNAL:

1. EPA File.
2. State & Lake Name.
3. Geo. Coordinates (Ctr, Inlet, Outlet).
4. Municipalities w/Impact on lake (from STORET).
5. Map References (Location of maps in other files).

B. INTERNAL:

1. Data Sheet - All of A plus quantitative results of PI effort.
2. TOPO map of drainage basin.
3. Photos, imagery & coverage plots (if any).
4. Overlay of P.I. Effort (keyed to B2)

COLLATERAL FILES

1. Lake Survey File - Lists all lakes in survey, geo coord., small scale maps; STORET Data Sheets.
2. State File - All lakes in survey in that state, pertinent maps.

PI EFFORT - LAND USE, POINT SOURCES OF POLLUTION

DELINEATE:

A. DRAINAGE BASIN

B. LAND USE

1. Agriculture
   a. Fertilized Cropland
   b. Pasture
   c. Cleared - Unproductive

2. Forest

3. Urban
   a. Intensive Development
   b. Medium Development
   c. Low Development

C. POINT SOURCES

1. Industrial
2. Municipal
3. Agriculture
4. Other

EPA LAKE SURVEY - PI EFFORT

TASK 1 - Collect material (photos, maps) delineate drainage basin. Flight planning, photo plots as needed.

TASK 2 - PI - Land use, point sources- produce overlay keyed to civil map.

TASK 3 - Mensuration of Task 2 overlay, areas, coordinates of point sources.

TASK 4 - Final Draft of overlay.

TASK 5 - Preparation of dossier.

COST THREE TYPICAL CLASSES OF LAKES - LARGE, MEDIUM, SMALL

CLASSIFIED

LARGE (Seneca, N.Y., Lake Wisconsin, Wis., Lake Muskegon, Mich.)
Drainage Basin - 1500 sq. miles.

Man Days - 14.6

55% - $1606 - 85% - $1911 - 115% $2215

MEDIUM (Cross Lake, N.Y., Ashokan Res., N.Y.)
Drainage Basin - 600-700 sq. miles.

Man Days - 5.85

55% - $663 - 85% - $786 - 115% - $909

SMALL (Lake Sarah, Auburn, Minn.)
Drainage Basin - 100 sq. miles.

Man Days - 3.1

55% -$362 - 85% - $430 - 115% - $497

COST THREE TYPICAL CLASSES OF LAKES - LARGE, MEDIUM, SMALL

UNCLASSIFIED

LARGE - Man Days 29.6

55% -$3231 - 85% - $3850 - 115% - $4468

MEDIUM - Man Days - 12.35

55% - $1376 - 85% - $1638 - 115% - $1899

SMALL - Man Days - 6.35

55% - $728 - 85% - $867 - 115% - $1005

TOTALS FOR THREE LAKES

CLASSIFIED: Man Days - 23.55 - 55% - $2631 - 85% - $3126 - 115% - $3621

UNCLASSIFIED: Man Days - 48.30 - 55% - $5336 - 85% - $6353 - 115% - $7372

ESTIMATED COSTS BASED UPON EXPECTED PHOTO COVERAGE AVAILABILITY 1972-1973:

(Depending on Coverage Availability: $1.30-$2.20 per sq. mi.)

LARGE:	50% - Classified	$2880
	50% - Unclassified	
	40% - Classified	$3073
	60% - Unclassified	
	70% - Classified	$2492
	30% - Unclassified	
MEDIUM:	50% - Classified	$1212
	50% - Unclassified	
	40% - Classified	$1297
	60% - Unclassified	
	70% - Classified	$1042
	30% - Unclassified	
SMALL:	50% - Classified	$ 648
	50% - Unclassified	
	40% - Classified	$ 692
	60% - Unclassified	
	70% - Classified	$ 561
	30% - Unclassified	

ASSUMPTIONS:

(1) GFE ACQUISITION AND PHOTO PROCESSING.

(2) B&L ZOOM TRANSFER DEVICES WITH ANAMORPHICS AND PLANIMETERS OBTAINED @ $15,000.

(3) PHOTO ACQUISITION REQUESTS CONTINUE PRESENT RATE OR ARE ACCELERATED.

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STAT

A. FACILITY STATEMENT

1. General

STAT was founded in 1957 and is an operation of the STAT specializes in research and development, in systems design and in service operations related to the collection, processing and management of data for earth resources exploration and planning, reconnaissance, mapping, geodesy, intelligence, and associated fields. In addition, designs and develops prototypes of a variety of complex data reduction equipment. 25X1

STAT staff includes scientists, engineers and highly skilled technicians drawn from Government, private industry and educational institutions. Many of these people are recognized internationally as authorities in their fields of specialization.

STAT business is currently divided equally between research and development for the U.S.Government and world wide mapping and resource surveys for private industries and local, state and federal governments.

2. Physical Facilities

STAT main facilities are located in new and modern quarters within the Equipment Development Laboratories, STAT Clients in the Washington, D.C. area are served by a facility located at STAT maintains facilities at the STAT which include an office and data reduction lab at STAT Special facilities and laboratories of the STAT Operation include: STAT

a. Imagery and Data Exploitation Laboratories

The Imagery and Data Exploitation Laboratories are equipped with stereo and monoscopic imagery viewers, layout tables, secure vaults, imagery and data files, and special image correlation, projection and mensuration equipment. The laboratories are arranged to accommodate a variety of separate interpretation and data processing projects, and provide ideal space for experimentation, analysis and evaluation tasks; and production operations including plotting, indexing, mosaicking, screening and interpretation.

b. Photogrammetric and Mensuration Facility

The principal equipment within Autometric's facility to perform photogrammetric and cartographic operations are B-8 Stereomats; STAT A-2000 Stereomats capable of producing orthophotographs or digitized terrain data automatically; SFOM dual purpose orthophotoscope/stereo-plotter; and Wild A-10 and Kelsh stereo plotters. Control plotting is performed with a Haag-Streit coordinatograph.

STAT

Drafting and scribing are performed for map production as well as color separation work for multi-colored mapping projects.

Mensuration tasks to within 1 micron are performed in the environmentally controlled areas housing precision measuring equipment consisting of Mann monoscopic comparators with digital outputs, an automatic point coordinate reader and viewer with digital output, and two Wild PUG point transfer devices, one of which has been modified to accommodate photography of differing scales. This equipment is supported by a scientific photographic laboratory, and gives Autometric one of the outstanding mensuration facilities in the country.

c. Photographic Laboratory

This laboratory is comprised of 20 rooms which are controlled carefully for temperature, humidity and dust. In addition to handling conventional photography tasks, the laboratory is geared for special services, such as: (1) the processing of various sensor records, i.e. infrared, side-looking radar and aerial camera records; (2) production of high acuity reproductions on glass in support of analytical photogrammetry and stellar plate measurements; and (3) continuous LogEtronic printing and continuous precision printing on formats varying from 70 mm - 9 1/2" to ± .005 weave, on special order. Some of the important capital equipment within this laboratory includes:

- LogEtronic CP/18 Contact Printer and SP10/70 Aerial Strip Printer
- EN-6A Continuous Printer, A-11-B and EN-1 Contact Printers
- Douthitt Industrial Printer (50" x 72")
- Leitz 35mm Precision Enlargers and Omega D-II Enlargers
- Durst Laborator V-184 Negative Format Enlarger (10" x 10")
- Borrowdale Precision Engineering Overhead Camera (48" x 72")
- LogEflo LD42" Processor and Kodak Versamat 11C Processor
- Ozalid 1000 Printmaster

d. Computation Systems and Facilities

The Computation Systems physically located in the STAT facility are an IBM-1130, an IBM-360/20 and an IBM-360/40.

Other computation facilities available to STAT area include:

- IBM-360/50
- CDC-6600
- CDC-6700
- UNIVAC-1108
- IBM-360/65
- IBM-360/75

Each of these systems includes the normal complement of peripheral equipments such as typewriters, magnetic tape units and card punch read and print facilities. An extensive library of special purpose computer programs is maintained to support a wide range of research and operational tasks.

STAT

e. Engineering and Manufacturing Spaces

These spaces are fully equipped for activities associated with the design, development, fabrication, manufacture and testing of breadboard engineering and production models of electro-mechanical devices, and include electronic assembly, mechanical assembly, test, and drafting areas. The excellent and extensive engineering and manufacturing facilities of the STAT Company are also available to the for special hardware STAT testing and manufacturing requirements.

f. Off-site Facilities

maintains two off-site facilities. Offices and laboratory STAT space are located in the STAT STAT The laboratories are equipped with mensuration and image interpretation instruments which afford the capability for research and engineering activities engaged in on behalf of Washington area clients.

The STAT . This STAT facility, comprising 1630 square feet, is staffed to accommodate a wide range of imagery and data exploitation tasks.

3. Facility Clearance

facility has a Top Secret clearance granted 3 August STAT 1966, DCASR, STAT

facility has a Top Secret clearance (Top Secret, STAT Final Clearance granted by DCASR, Philadelphia, Pennsylvania). STAT Office has a Top Secret clearance, granted by DCASR, 666 Summer St., STAT on 7 December 1967. STAT

STAT

B. ORGANIZATION

STAT organization chart appears on the following page.

STAT Photographic Laboratory and Mapping and Applied Photogrammetry Departments are staffed and equipped to undertake all facets of an operational program and provide support services to other Autometric groups as required.

The Instrumentation Systems Department is responsible for the development of new or advanced electro-mechanical-optical devices for the processing, reduction or exploitation of remote sensor imagery or data.

The Program Development Department is responsible for the development of systems and techniques for mapping, earth resources, reconnaissance and related fields. The department is staffed with scientists comprising a broad range of disciplines and technologies, and operates on a program management basis.

offsite facilities are responsible for providing specialized technical services and performing R&D for clients in those areas requiring "close" support. The offices are staffed with scientists and technicians required for this support and the offices include laboratories and equipment for research activity. 25X1